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(**THE CONVECTIVE HEAT TRANSFER  
BIBLIOGRAPHY**)

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*Special Bibliographies Section  
Science and Technology Division  
Library of Congress  
Washington, D. C.*

**AMPTIAC**

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# **THE CONVECTIVE HEAT TRANSFER BIBLIOGRAPHY**

*CLEMENT R. BROWN*

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## FOREWORD

This report has been prepared by the Science and Technology Division, Library of Congress, as a task under Delivery Order No. D. O. 33(657)-63-388 and previous Orders, which covered the compilation of a bibliography and index on the subject of convective heat transfer. The work has been carried out under the direction of the Materials Information Branch, Materials Applications Division, Air Force Materials Laboratory, with John H. Charlesworth, MAAM, as project monitor. This is a summary technical report covering the entire task from February 1961 through August 1967.

The compilation of the Convective Heat Transfer Bibliography was performed under the direction of Dr. Clement R. Brown, Head of the Special Bibliographies Section, with the assistance of quite a few people, most of whom are no longer at the Library of Congress. The major professional contributions were made by Joseph Enke, Jack R. Gibson, Thomas Goodwin, Peter Halpin, Thomas LaMoure, and Miss Joyce Wolfe. Clerical assistance was rendered by Mrs. Lillie Frye, Mrs. Virginia Sims, and Mrs. Beatrice Treese, and particularly Mrs. Patricia Gravatt, who typed most of the abstract cards. Our special thanks go to Mrs. Treese, Mrs. Frye and Mr. Gibson for their excellent work in coding the 2000 abstract cards for subject indexing and preparing the code listings. Finally, we are indebted to Mr. John Charlesworth of AFML for his guidance on this task and his patience in awaiting the final products.

This report has been reviewed and is approved.



EDWARD DUGGER

Chief, Materials Information Branch  
Materials Applications Division  
AF Materials Laboratory

## ABSTRACT

The Convective Heat Transfer Bibliography is a compilation of 2000 references with abstracts to the monographic, periodical, and report literature issued from 1955 to 1962, on the subject of convective heat transfer and its aerospace applications. The references and abstracts have been typed on 5x8 cards. The bibliography is supplemented by a set of 2000 IBM punched cards, constituting a subject index in considerable depth to the same references, and suitable for retrieving the information in the respective abstracts. This report defines the scope of the task, outlines the bibliographic procedures followed, and describes the end products resulting from the work.

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# THE CONVECTIVE HEAT TRANSFER BIBLIOGRAPHY

## I. INTRODUCTION

The Convective Heat Transfer Bibliography is a compilation of 2000 references with abstracts of monographic, periodical, and report literature issued from 1955 to 1962 on the subject of convective heat transfer. It is supplemented by a set of 2000 IBM punched cards constituting a subject index in considerable depth to the same references. It was compiled by the Special Bibliographies Section of the Science and Technology Division, Library of Congress, for the Air Force Materials Laboratory, Wright-Patterson Air Force Base, Ohio, under Delivery Order (33-616)-61-05, and subsequent Delivery Orders. The IBM punched cards are intended to serve as a "satellite" subsystem to the extensive Document Retrieval System now in operation at the Aerospace Materials Information Center of AFML.

This report describes the task as originally defined and its later modifications, the scope of the literature search carried out, the characteristics of the individual reference and abstract, card, the bibliographic procedures followed, and finally the IBM cards and codes forming the subject index suitable for retrieving the information in the respective abstracts.

## II. THE TASK

1. Requirements. As defined in the original Delivery Order (33-616)-61-05, this task was the compilation and indexing of a comprehensive bibliography on convective heat transfer, with abstracts. Each reference was to be typed on a 5x8 card, furnished in duplicate, serially numbered, and assigned "descriptive terms" indicating the subject matter of the reference. In addition, each of these index terms was to be key-punched on a standard 80 column IBM card, with the serial number and other identification for the given reference.

2. Previous history. Interest in the compilation of the present bibliography was engendered by the existence, in the files of the Science and Technology Division of the Library of Congress, of an incomplete compilation of several thousand unannotated references on the very broad subject of Heat Transfer. This compilation had been started under a general Office of Naval Research contract (primarily covering other services) but which was discontinued by ONR, along with other literature surveys, for budget

reasons. It was therefore originally intended to include all of those references (1938-1949) related to the subject of convective heat transfer in the present compilation, but this has not been possible as will be explained later.

3. Administrative changes. The terms, including the scope of the compilation, of Delivery Order (33-616)-61-05 were based upon an estimate of costs and time required, submitted previously by the Library of Congress. A sampling type of preliminary survey of existing literature had at that time indicated that the task would require at least three years, and a tentative annual rate of funding was suggested. This rate of funding was followed for the first two years, but before the end of two years work, it was evident that at least two more years work would be required, with an appreciable increase in funding, if LC was to cope with some 100% increase in heat transfer literature between 1958 and 1961, undoubtedly resulting from the developing interest in space travel and high-speed aircraft at that time. At the request of AFML, a revised budget was submitted in January 1963, but after several months delay, we were advised that the Air Force would be unable to furnish more than 70% of the funds requested, with no assurance of further funds in the future. This decision greatly affected the further progress of the task and was the primary reason why the task was not completed as originally planned. The resulting changes in plans and the final product will be indicated later.

### III. SCOPE

1. Subject. The subject scope was well-defined in the above Delivery Order by means of an outline agreed upon by the Air Force Materials Laboratory (AFML) and the Library of Congress (LC). Both free and forced convective heat transfer, the effects of various factors, heat transfer processes involving convection, heat transfer media, heat exchangers, and heat transfer and related measurements, were to be included. Later, a "Guidance Outline," indicating in more detail which subjects were to be included, and which were to be excluded, was drawn up in a conference between representatives of AFML and LC. With few modifications, the Subject Outline and Guidance Outline have been followed carefully in searching for references throughout the task. Both are shown in Appendix I.

2. Time period to be covered. Originally it was intended to include the applicable references to literature issued from 1938 to 1949, compiled previously, and all literature published from 1950 on.



When the funds became curtailed in 1963, however, it was decided to cover as much of the literature after 1954 as possible, and hopefully to include the earlier compilation.

3. Types of literature. Monographs (books) and journal papers, in English, French, German, Russian and other languages, were to be included, together with both unclassified and classified reports. Actually, however, the bulk of the material is in English, and with few exceptions, only unclassified reports have been included. The titles and abstracts for the latter are unclassified.

#### IV. THE REFERENCE AND CARD

Each item in the bibliography consists of a citation, or reference, and an abstract, on a 5x8 card, with assigned index terms.

1. Citation. For books, the citation gives in this order:

Name of the first author, followed by his initials.

Names of other authors, if any, in normal order.

Title in English, in brackets if translated.

Title in original language, if other than English.

Place of publication.

Date of publication.

Number of pages.

The citation for journal articles gives:

Name of first author, and initials.

Names of other authors, if any, in normal order.

Title in English, in brackets if translated.

Title in original language, if other than English.

Name of journal, using abbreviated elements (See Appendix II).

Journal volume number, issue number, date, and full pagination of paper.

The citation for reports is similar to that being used in the Technical Abstract Bulletin, and is as follows:

Name of corporate author (Agency or contractor), giving the parent organization first, followed by the name and location of the major subdivision doing the work.

Title of the report.

Names of personal authors.

Date of report, pagination, notes on tables etc.

Contract number, if any.

Contractor's (or sponsoring agency's) report number.

Accession number in a collection (e.g., AD 191234).

Security classification.

Further identification, such as translation information, paper number in a series, etc. is frequently added.

2. Abstract. The abstract is usually of the informative type, describing the work that was done, and summarizing the principal results obtained. The author's (or contractor's) abstract has been used whenever it has been deemed adequate for the purpose of the bibliography, in which case credit is given.

3. Abstract card. Each reference and abstract has been typed on a 5x8 card, identified by a six-digit number in the upper right corner. The first two digits indicate the year of publication and the last four an "accession number" for publications of that year, assigned as the item was being processed. Open literature items (books and journal articles) were assigned numbers below 5000, while reports have numbers from 5000 up. (Some numbers were assigned to items later omitted so that for any one year some consecutive numbers may be missing.) The various subject index terms assigned to the given

reference are listed at the bottom of the card, below the abstract. In the case of lengthy abstracts, a continuation card (or cards) was used, and the index terms appear on this card.

4. Subject index terms. Every item has been assigned a number of index terms which serve to indicate all of the subjects relating to convective heat transfer and of significant importance in the given item. These subject index terms were selected from a list of about 1000 terms which had been compiled by the bibliographers and approved by the Air Force Materials Laboratory after revision. The "Alphabetical Listing of Subject Codes" (See Appendix IV) constitutes a complete list of the subject terms used, although it should be noted that in some cases the original term used on the card has been edited or elaborated in compiling the Alphabetical Listing.

## V. PROCEDURE

In compiling this bibliography some seven operations were involved. These included: searching, verifying, abstracting, indexing, editing, typing, and proofreading.

1. Searching. The first step consisted of compiling as many references as possible which were tentatively judged to be pertinent to the subject on the basis of title, abstract or subject indexes, etc. The following are the principal sources which have been searched for this task:

Library of Congress card catalogs.

Engineering Index, 1949-1961.

Heat Bibliography (annual volumes issued by the Department of Scientific and Industrial Research, Great Britain)

About 50 "core" journals, cover to cover.

Various symposia, etc., on heat transfer.

Title Announcement Bulletin (original TAB), complete from 1953 to 1957.

Technical Abstract Bulletin (present TAB) from 1957 through 1961.

Various bibliographies appearing in publications already abstracted.

Many other sources, such as Chemical Abstracts and Science Abstracts, could have been searched if more time and funds had been available. As it was, a total of over 18,000 unverified references were obtained by searching. Assuming that many of these would eventually be eliminated as duplicates or not pertinent, it is obvious that had it been possible to follow the original plan, a bibliography of several thousand more items could have been compiled. In addition, there could have been some 1500 unannotated references to the 1938-1949 publications collected in the previous task, but not edited.

2. Verifying and abstracting. Every effort is made to verify references in the original, which serves to eliminate errors in the citation, to determine that the publication is pertinent to the subject, to permit the preparation of an adequate abstract, and to provide additional references to the subject. If the paper is pertinent, abstracting is done at this time, or the author's abstract is used, if adequate (See Sect. IV-2 for a description of the abstract). A total of 2800 abstracts were prepared, but it was possible to index, edit, and type only 2000 of them in the final form.

3. Indexing. In general, the assignment of the subject index terms (See Section IV-3) was made later inasmuch as it was not advisable to establish the list of index terms until at least 1000 references had been abstracted. Usually indexing was done by the editor, and has been based on the abstract rather than the complete paper.

4. Editing. Experienced personnel, thoroughly familiar with the subject, were assigned to editing both the citation and abstract, and selecting the index terms. The editing bibliographer was responsible for determining that the abstract and indexing were adequate.

5. Typing and proofreading. After editing the complete reference, abstract and index terms were typed on a 5x8 card, using an IBM proportional spacing electric typewriter, in "Charter" type. If necessary, a second and third card was used rather than type on the back of the first card. The card was then proofread, and after corrections had been made, three Xerox copies were made. Two of these were sent to AFML in sets of 1000 references each. Samples of completed cards are shown in Appendix III.

## VI THE IBM CARD

The final phase of this task was the preparation of a master set of IBM cards with the following information:

Abstract card number  
Author (or authors)  
Index terms in code

1. Abstract card number. The abstract card number consists of the six digit number assigned to the reference at time of processing (See Sect. IV-3), which serves to indicate the year of publication, whether the item is a report or an "open" publication, and the accession number, prefixed by the letter C to indicate a Library of Congress abstract. This is followed by 1, 2, or 3 which indicate this is the first, second or third IBM card for this item. The first 10 columns on the IBM card are used for this identification. Examples are:

C58-0116-1  
C60-5008-2

2. Author(s). Columns 12 through 32 are used for authors. For books and papers, the last name of the first author followed by his initials (without periods), and as much of the names of second and third authors, without initials but separated by spaces, as 21 columns would permit, are punched directly on the card. Thus the authors of Item no. 58-0116 are P. Fortescue and D. V. Wordsworth, which names become FORTESCUE P WORDSWORTH on the card. Anonymous publications are indicated by the first 21 letters of the title; thus the entry for "New Metals-Research and Production" becomes NEW METALS RESEARCH. Punctuation and diacritical marks are omitted.

For reports, the first 21 letters of the name of the organization producing the report are used. Thus Sylvania Electric Products, Inc., etc., becomes SYLVANIA ELECTRIC PRO. In general, commonly accepted abbreviations have been used, including acronyms such as NASA for National Aeronautics and Space Administration, WADC for Wright Air Development Center, etc.

3. Index terms in code. Each index term has been assigned a three digit (in a few cases four digit) code number and the IBM cards have been punched with the code numbers corresponding to the subjects listed on the abstract cards. For example, abstract number 58-0116 has been indexed and coded as follows:

Gas turbines	325
Regenerators	672
Heat exchangers	354
Coolants	158

These numbers appear along the top right margin of IBM card no. C58-0116-1. Columns 34 to 80 inclusive have been reserved for the subject codes, which permits a maximum of twelve three-digit codes, separated by spaces. A second IBM card, identified in the same manner as the first, except with the number 2 in column 10, has been used wherever there are more than twelve subjects and a third card for more than 24 index terms.

Since there turned out to be a total of 1031 index terms, it was necessary to assign 4-digit codes to 32 subjects. On the 24 IBM cards affected, the four-digit codes are punched first, without spaces, followed by the three-digit numbers spaced as usual. This Card number C60-0218-1 is coded 101610141030 352 488, indicating five subjects.

4. Subject code listings. Two code listings for use with the IBM master cards have been supplied. The Numerical Listing in an arrangement of all subject codes used, from 001 to 999, and from 1001 to 1032, in numerical order. The Alphabetical Listing is a list of the same subjects, in alphabetical order, with the corresponding code number in the left column. Certain characteristics of the terminology and word order used in these listings are pointed out, and a special table listing the temperature ranges corresponding to codes 795 to 805 inclusive, is included.

The following are illustrated in Appendix IV:

- (1) Sample IBM card for an open literature item showing personal author (C58-0116-1)
- (2) Sample IBM cards for a report item, showing corporate author and more than 12 subjects requiring two cards (C60-5008-1 and C60-5008-2)
- (3) Sample IBM card, using four-digit subject codes (C60-0218-1)
- (4) Subject code; numerical listing.
- (5) Subject code; alphabetical listing.
- (6) Codes for temperature ranges.

## VII. SUMMARY AND CONCLUSIONS

A partial bibliography on Convective Heat Transfer, consisting of 2000 references with abstracts, to both published literature and reports issued during the period 1955 - 1962 has been compiled for the Air Force Materials Laboratory. Each reference has been subject-indexed in considerable depth, using about 1000 approved terms, based primarily on the material at hand. The reference, abstract and index terms have been typed on 5x8 abstract cards, two copies of which were delivered to the Air Force Materials Laboratory in lots of 1000 each. In addition the sponsoring agency has been supplied with a master set of over 2000 IBM cards, each identified by a number and the name of either the personal or corporate author, and punched by a series of numeric codes indicating the index terms assigned to the given reference.

## APPENDIX I

### a. Subject Outline

1. Heat transfer in general
2. Convection
  - (a) Theory
  - (b) Mathematics
  - (c) Natural convection
  - (d) Fluid flow with heat transfer
3. Effects of various factors
  - (a) Gravity
  - (b) Centripetal acceleration
  - (c) Pressure
  - (d) Electromagnetic forces
  - (e) Boundary conditions
  - (f) Turbulence
  - (g) Magnetic and electric fields
4. Heat transfer processes involving convection
  - (a) Boiling
  - (b) Evaporation
  - (c) Condensation
  - (d) Thermal diffusion
5. Heat transfer media
  - (a) Liquid metals
  - (b) Organic fluids
  - (c) Other fluids
  - (d) Two phase mixture
6. Heat exchangers in general
  - (a) Theory
  - (b) Design
  - (c) Operation
  - (d) Performance



7. Heat exchanger types

- (a) Boilers
- (b) Condensers
- (c) Fluid heaters
- (d) Evaporators
- (e) Cooling equipment

8. Heat transfer and related measurements

- (a) Conductivities
- (b) Emissivities
- (c) Heat transfer coefficients
- (d) Temperature
- (e) Pressure
- (f) Viscosity
- (g) Heat content
- (h) Specific heat

b. Guidance Outline

Object: Convective heat transfer with respect to fluid heat transfer media, including those which can be used as coolants and lubricants for aircraft and space vehicle power systems; also environmental heat transfer within and without the aircraft or space vehicle, including aerodynamic heating. Research, development and applications to be included.

---

To be included

To be omitted

I. HEAT TRANSFER IN GENERAL

---

Convection

Cryogenics down to temperature of liquid oxygen  
(-218°C)

Conduction per se  
Radiation per se  
Convection only below  
-218°C  
1°K (Absolute zero)

To be included

To be omitted

I. HEAT TRANSFER IN GENERAL (continued)

---

Related fields

In any case:  
Magnetohydrodynamics  
(possibly)

Unless convective heat  
transfer is involved:  
Fluid dynamics  
Reacting gas  
Dissociating gas  
Turbulence  
Boundary layer  
Mass transfer  
Thermodynamics  
Heat insulation

---

II. CONVECTION

---

Theory  
Mathematics  
Natural convection  
Forced convection  
Fluid flow with H.T.  
to or from the fluid

Heat sources

Aerodynamic heating

Electrical induction  
Radioactivity  
Acoustical energy

Convection in:

Ceramics  
Chemical engineering  
Electrical equipment cooling  
Electronic equipment cooling  
Metallurgy  
Nuclear physics  
Physical chemistry  
Physics  
Refrigeration  
Solar power  
Waste heat utilization

Air conditioning  
Biology  
Chemistry in general  
Household heating  
Industrial heating  
Medicine  
Meteorology  
Oceanography

To be included

To be omitted

---

II. CONVECTION (continued)

Specific subjects

Flow with shock wave  
Entropy changes  
Thermodynamics  
Energy balances  
Compression without  
heat addition externally

---

III. EFFECTS OF VARIOUS FACTORS

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Boundary conditions  
Centripetal acceleration  
Density  
Dissociation-association  
Electromagnetic forces  
Gravity  
Ionization  
Pressure  
Turbulence

Acoustics  
Chemical reactions  
Combustion  
Shock waves

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IV. HEAT TRANSFER PROCESSES INVOLVING CONVECTION

---

Boiling  
Condensation  
Evaporation  
Fusion  
Melting  
Solidification  
Sublimation  
Supercooling  
Thermal diffusion  
Transpiration  
Physical chemistry  
aspects of changes in state

Ablation  
Natural evaporation

To be included

To be omitted

---

V. HEAT TRANSFER MEDIA

---

Coolants  
Liquid metals  
Lubricants  
Organic fluids  
Steam (limited\*)  
Two phase mixtures  
Water (limited\*)

Antifreeze as such  
Non-Newtonian fluids  
Plasmas (outer space)  
Solids in "fluid-like"  
form

\*omit basic thermal  
properties (steam tables,  
etc.)

Properties

Emissivity  
Flammability  
PVT relations  
Specific heat  
Specific volume  
Thermal conductivity  
Thermal diffusivity  
Toxicity

Other thermodynamic  
properties (entropy, etc.)  
Quality of steam

---

VI. HEAT EXCHANGERS IN GENERAL

---

Theory  
Design  
Operation  
Performance  
Components  
Tubes  
Fins  
Plates

Methods of testing  
Manufacture  
Maintenance  
Repair  
Automatic control systems

1955 forward only:  
Control devices:  
Temperature  
Pressure  
Flow

To be included

To be omitted

---

VI. HEAT EXCHANGERS IN GENERAL (continued)

---

Design, operation and performance factors

Resistance to fluid flow  
Effects of corrosion, scale,  
etc. on H.T.

1955 forward only:

Handbook data  
Strength  
Thermal efficiency  
Thermal economy  
Mechanical efficiency  
Cost economy

---

VII. HEAT EXCHANGER TYPES

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Boilers  
Condensers  
Cooling equipment  
Evaporators  
Fluid heaters  
Regenerators (non-steam)  
Superheaters (non-steam)

Distillation equipment  
Economizers  
Furnaces  
Heat pumps  
Heaters  
Preheaters  
Steam regenerators  
Steam superheaters

a. Types of boilers

Water tube  
Fire tube  
Electric  
Nuclear

Stationary (power plants)  
Marine  
Package

b. Types of cooling equipment

Water as coolant  
Air as coolant  
Vapor phase cooling  
Evaporative cooling  
Transpiration cooling

Spray cooling

To be included

To be omitted

---

VII. HEAT EXCHANGER TYPES (continued)

---

For power equipment only:

Oil coolers  
Intercoolers  
Intake charge cooling

c. Cooling applications

Aircraft engines  
Gas turbines  
Rocket motors

Automotive engines  
Diesel engines  
Machining operations

For aircraft or space  
vehicles only:

Space cooling  
Mechanical equipment  
Electrical equipment  
Electronic equipment

d. Types of fluid heaters

Gases  
Organic liquids  
Other H.T. media

Feedwater

e. Kinds of reference material

News items with something  
    revolutionary only  
Descriptive material if  
    quantitative data are given  
Reviews with H.T. data  
Critical evaluations, com-  
    parisons, etc. of methods,  
    equipment, instruments

Popular material  
News items in general  
Short descriptive material  
Descriptive material without  
    design or performance data

To be included

To be omitted

---

VIII. HEAT TRANSFER AND RELATED MEASUREMENTS

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Thermal conductivity  
Emissivity  
Heat transfer coefficient  
Temperature  
Pressure  
Density  
Viscosity  
Fluid flow  
Heat content  
Specific heat

a. Measurements in general

Effects of factors listed in  
    III  
\* Errors and corrections in  
    measurement  
Instruments:  
    \*Design principles and data  
    \*Accessory equipment such as  
        leads, circuits, indicators,  
        recorders  
    \*Applications  
    \*Proper installation  
    \*Operation  
    \*Calibrating methods

Theory  
Mathematics  
Interpretation aids:  
    Charts  
    Nomographs  
    Formulas  
    Correction tables, etc.  
Industrial equipment in  
    general

b. Thermal conductivity

Data

Fluids  
Heat exchanger materials

Mathematical derivations

Fluids

Solids

---

\* For precision type laboratory  
    and research instruments only

\*Omit for industrial type  
    of instruments

---

To be included

To be omitted

---

VIII. HEAT TRANSFER AND RELATED MEASUREMENTS (continued)

---

Methods of determination

Fluids

Solids

c. Emissivity

Data for fluids and solids

Total radiation  
Method of measurement

d. Heat transfer coefficient

Data for all conditions  
involving fluids

Data for all types of heat  
exchangers in VII

Methods of measurement or calcu-  
lation

Derivation of formulas

Data for solids  
Heat exchangers omitted  
in VII  
Structural elements

e. Temperature

Range:

Liquid O<sub>2</sub> to over 100,000°F

Differential temperature  
measurements

Calibration methods down to -80°F

Instruments

\*Thermometers

\*Thermocouples

\*Thermopiles

\*Pyrometers

\*Resistance thermometers

Temperature indicating  
paints and crayons  
Spectroscopic methods  
in general

f. Pressure

Range:

10 mm. absolute to  
3000 p.s.i.

Differential pressure  
measurements

Pressure due to light,  
sound, etc.



To be included

To be omitted

---

VIII. HEAT TRANSFER AND RELATED MEASUREMENTS (continued)

---

Instruments

\*Vacuum gages  
\*Manometers  
\*Pressure gages

g. Density (Specific volume)

Data for fluids  
Temp. range as in (e)  
Pressure range as in (f)

Data for solids  
Method of determination

h. Viscosity

Data for Newtonian fluids  
Methods of determination  
Theory  
Formulas

Non-Newtonian fluids

i. Fluid flow

Range:  
No restrictions  
Calibration methods

Instruments

\*Flowmeters  
\*Rotameters  
\*Orifice meters  
\*Electromagnetic flowmeters

Pitot tubes  
Displacement meters

Applications

\*Air  
\*Gases  
\*Water  
\*Oil  
\*Organic liquids

---

\*Precision type laboratory and  
research instruments only

\*Omit industrial  
type instruments

---

To be included

To be omitted

---

VIII. HEAT TRANSFER AND RELATED MEASUREMENTS (continued)

---

j. Heat Content

Data on fluids

Data on solids  
Methods of determination

k. Specific heat

Data

Fluids and solids  
Both  $C_p$  and  $C_v$

Methods of determination

Fluids

Solids

---

## APPENDIX II

### List of Abbreviated Words for Serial Titles

acad.	Academy
aeronaut.	Aeronautic(al), Aeronautics
akad.	akademija [Ru]
Amer.	American
appl.	Applied
Brit.	British
bur.	Bureau
canad.	Canadian
chem.	Chemical, Chemistry
conf.	Conference
eng.	Engineering
engrs.	Engineers
indus.	Industrial, Industry
inst.	Institute, Institution
internat.	International
izvest.	izvestija [Ru]
jour.	Journal
mag.	Magazine
math.	Mathematical, Mathematics
mech.	Mechanic(al), Mechanics
nat.	National

List of Abbreviated Words for Serial Titles (continued)

philos.	Philosophic(al)
phys.	Physical, Physics
proc.	Proceedings
progr.	Progress
quart.	Quarterly
refrig.	Refrigeration
res.	Research
rev.	Review
roy.	Royal
sci.	Science
scient.	Scientific
soc.	Society
technol.	Technologic(al), Technology
trans.	Transactions
univ.	University
zeitschr.	Zeitschrift [Ge]

## APPENDIX III

### Sample Reference-Abstract Cards

55-0001

Fuks, N. A.

[THE MECHANICS OF AEROSOLS.] Mekhanika aerolei. Moskva, Izdatel'stvo Akademii Nauk SSSR, 1955, 351 p. (Translated as CWL Special Publication 4-12, Army Chemical Center, Chemical Warfare Labs., Md., [1958], 448 p. 581 refs. QD549.F913; AD 227876) QD549.F9

Limited information is contained on interrelations of aerosols and such thermal phenomena as convection, diffusion, evaporation, condensation, and action of radiometric forces (aerosol particles being repelled by heated bodies.)

58-0116

Fortescue, P. and D. V. Wordsworth

GAS-TURBINE REGENERATOR PERFORMANCE. Eng., v. 185, Feb. 25, 1958: 284-286.

This article seeks to show how the bulk of a regenerator, in a very-high-temperature nuclear reactor-gas turbine closed circuit, is affected by the choice of working fluid. Completely general conclusions about heat-exchanger sizes are reached and quantitative results with different gases are tabulated.

60-5008

National Bureau of Standards. Cryogenic Engineering Lab., Boulder, Colo.

A COMPENDIUM OF THE PROPERTIES OF MATERIALS AT LOW TEMPERATURE (PHASE I). PROPERTIES OF FLUIDS, V. J. Johnson - ed. Rept. for Jan. 1958 - Mar. 1959 on Thermophysical Properties of Cryogenic Materials. Oct. 1960, 1 vol., diagrs., tables, refs. (AF 33(616)58-4; WADD TR 60-56, pt. 1) AD 249644 UNCLASSIFIED

Data are given for the properties of density (including some PVT data), expansivity, thermal conductivity, specific heats and enthalpy, transition heats, phase equilibria, dielectric constants, adsorption, surface tension and viscosity for the solid, liquid and gas phases of helium, hydrogen, neon, nitrogen, oxygen, air, carbon monoxide, fluorine, argon and methane wherever adequate data could be collected. Data sheets, primarily in graphic form, are presented from "best values" of data collected. The source of the material used, other references and tables of selected values with appropriate comments are furnished with each data sheet to document the data presented. Conversion tables and other helpful information are also included. Although bound, the volume is intended basically as a looseleaf report for continuous expansion and revision as new and revised data sheets are produced. The specified temperature range of primary interest was from near absolute zero to 110°K. Where desirable and practicable, however, data are included for temperatures up to near room temperature (300°K). (Author, modified)

Cryogenic fluids; Liquids; Gases; Temperature, cryogenic; Helium; Hydrogen; Neon; Nitrogen; Oxygen; Air; Carbon monoxide; Fluorine; Argon; Methane; Density; PVT data; Thermal conductivity; Specific heat; Enthalpy; Viscosity; Handbooks

Library of Congress  
Science and Technology Division  
Convective Heat Transfer

## APPENDIX IV

a. Sample IBM cards

1. Open literature; personal author

C58-0116-1 FORTESCUE P WORDSWORTH 325 672 354 158

[illegible]

## 2. Four-digit subject codes

C60-0218-1 JENNINGS L D MILLER S101610141030 352 488

[illegible]

3. Report; corporate author; more than 12 subjects, requiring  
2 cards

060-5008-1 NBS

180 457 326 809 379 391 523 536 558 018 118 295

[illegible]

C60-5008-2 NRS

053 499 199 633 824 728 245 905 347

[illegible]

b. Subject code; numerical listing

001 Ablation  
002 Absorber materials  
003 Acceleration  
004 Acetamide, dimethyl  
005 Acetate, butyl  
006 Acetate, ethyl  
007 Acetate, vinyl  
008 Acetone  
009 Acetone - water mixtures  
010 Acetylene  
011 Acoustic effects  
012 Acoustic vibration  
013 Additives  
014 Adiponitrile  
015 Aerodynamic heating  
016 Aerosols  
017 Aerospace vehicles  
018 Air  
019 Air coils  
020 Air coolers  
021 Air cooling  
022 Aircraft  
023 Aircraft, hypersonic  
024 Aircraft, supersonic  
025 Aircraft (X-15)  
026 Aircraft engines  
027 Aircraft equipment  
028 Aircraft fuel  
029 Aircraft materials  
030 Airfoils  
031 Airframe materials  
032 Airframes  
033 Air-helium mixtures  
034 Alcohols  
035 Aliphatic compounds  
036 Alloys  
037 Altitude  
038 Accomodation coefficient  
039 Aluminum  
040 Aluminum 61S  
041 Aluminum 1100  
042 Aluminum 3003  
043 Aluminum alloys  
044 Aluminum bromide  
045 Aluminum chloride



046 Aluminum oxide  
047 Aluminum-Mg  
048 Aluminum-1.2 Mn  
049 Ammonia  
050 Analog methods  
051 Analysis  
052 Annular fins  
053 Annular flow  
054 Annuli  
055 Argon  
056 Argon - benzene mixtures  
057 Argon - xenon mixtures  
058 Armco iron  
059 Aspect ratio  
060 Austenitic  
061 Axial mixing  
062 Axially symmetric bodies  
063 Bakelite  
064 Benzene, 1, 4-diphenoxy  
065 Benzene, dichloro  
066 Benzene mixtures  
067 Benzene - toluene mixtures  
068 Benzenes  
069 Benzenes, chloro  
070 Benzenes, trimethyl  
071 Benzoic acid  
072 Beryllium  
073 Beryllium acetate complex  
074 Beryllium copper  
075 Beryllium oxide  
076 Bibliography  
077 Thermometers, bimetallic  
078 Binary mixtures  
079 Bingham fluid  
080 Biphenyl, monoisopropyl  
081 Bismuth-lead alloys  
082 Ether, bis(p-phenoxyphenyl)  
083 Bluff bodies  
084 Blunt bodies  
085 Bodies of revolution  
086 Boilers  
087 Boiling  
088 Diatomaceous earth, borated  
089 Boundary conditions

090 Boundary layer factors  
091 Boundary layer flow  
092 Boundary layer transition  
093 Boundary layers  
094 Brass  
095 Bromine  
096 Bubble formation  
097 Bulk boiling  
098 Bulk modulus  
099 Acetate, amyl  
100 Bulk velocity  
101 Buoyancy  
102 Burnout  
103 Butadiene  
104 Butane  
105 Butane, trichloroheptafluoro  
106 Butanol  
107 Butene, methyl  
108 Butyrate, ethyl  
109 Cadmium  
110 Calcium aluminates  
111 Calcium borate  
112 Calibration  
113 Calorimeters  
114 Carbon  
115 Carbon dioxide  
116 Air - carbon dioxide mixtures  
117 Carbon disulfide  
118 Carbon monoxide  
119 Alumel  
120 Carbon tetrachloride  
121 Carbopol  
122 Carboxy methyl cellulose  
123 Centripetal acceleration  
124 Ceramic coatings  
125 Ceramic fuels  
126 Ceramics  
127 Cesium  
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129 Channels, circular  
130 Channels, flat  
131 Channels, horizontal  
132 Channels, rectangular  
133 Channels, triangular

134 Channels, vertical  
135 Chlorine  
136 Ethanol, 2-chloro - ether, diisopropyl mixtures  
137 Chromium  
138 Chromium-plated  
139 Coatings  
140 Compatibility  
141 Compressibility  
142 Compressible flow  
143 Compressors  
144 Computation  
145 Condensation  
146 Condensation coefficient  
147 Condensers  
148 Condensers, tube  
149 Condensers, wire  
150 Cones  
151 Configuration  
152 Contamination  
153 Contamination effects  
154 Convection coefficient  
155 Convection velocity  
156 Convective heat transfer  
157 Coolant pumps  
158 Coolants  
159 Cooling  
160 Cooling coils  
161 Cooling equipment  
162 Cooling systems  
163 Copper  
164 Copper tubes  
165 Coriolis forces  
166 Corn syrup  
167 Correlation  
168 Corrosion  
169 Cost economy  
170 Couette flow  
171 Counter flow  
172 Creep  
173 Critical constants  
174 Critical point  
175 Critical region  
176 Critical state  
177 Boron oxide

178 Carbon dioxide - nitrogen mixtures  
179 Cross flow  
180 Cryogenic fluids  
181 Cryogenic hydrogen  
182 Cryogenic oxygen  
183 Cyclohexane - heptane mixtures  
184 Cyclohexanes  
185 Cylinders  
186 Cylinders, circular  
187 Cylinders, concentric  
188 Cylinders, elliptical  
189 Cylinders, horizontal  
190 Cylinders, inclined  
191 Cylinders, porous  
192 Cylinders, rotating  
193 Cylinders, transverse  
194 Cylinders, vertical  
195 Cylinders, yawed  
196 Shells, cylindrical  
197 Data  
198 Decay heat  
199 Density  
200 Design  
201 Deuterium chloride  
202 Deuterium oxide  
203 Development  
204 Diborane  
205 Chloroform  
206 Glycol, diethylene  
207 Diffusion  
208 Diffusion regions  
209 Diffusivity  
210 Digital methods  
211 Amine, dimethyl - ether mixtures  
212 Glycol, dimethyltetraethylene  
213 Shock waves  
214 Diphenyl  
215 Diphenyl - diphenyl oxide mixtures  
216 Disks  
217 Dissociating gas  
218 Dissociation-association  
219 Dodecanethiol  
220 Dodecene  
221 Drops

222 Dropwise condensation  
223 Ducts  
224 Ducts, circular  
225 Ducts, cylindrical  
226 Ducts, flat  
227 Ducts, horizontal  
228 Ducts, polygonal  
229 Ducts, rectangular  
230 Ducts, triangular  
231 Ducts, vertical  
232 Dural  
233 Edges  
234 Effectiveness  
235 Eicosane  
236 Electric fields  
237 Electric forces  
238 Electrical equipment  
239 Electrolytes  
240 Electron tubes  
241 Electronic equipment  
242 Emissivity  
243 Enclosures  
244 Energy  
245 Enthalpy  
246 Environment  
247 Temperature, environmental  
248 Errors  
249 Ethane  
250 Ethane, trifluoro  
251 Ethanol  
252 Ether, ethyl  
253 Chloroform - ether mixtures  
254 Amine, ethyl  
255 Ethylene  
256 Ethylene, trichloro  
257 Ethylene dichloride - toluene mixtures  
258 Glycol, ethylene  
259 Air - ethylene flames  
260 Argon - ethylene mixtures  
261 Ethyne  
262 Eutectic mixtures  
263 Evaporation  
264 Evaporation coefficient  
265 Evaporators

266 Experimental  
267 Film boiling  
268 Film condensation  
269 Film cooling  
270 Film heating  
271 Finned tubes  
272 Fins  
273 Fins, sandwich structure  
274 Fins, transverse  
275 Flames  
276 Flight simulation  
277 Flinak (Salt "A")  
278 Flow, one-dimensional  
279 Flow, three-dimensional  
280 Flow, two-dimensional  
281 Flow, two-phase  
282 Flow control  
283 Flow friction  
284 Flow measurement  
285 Flow pulsations  
286 Flow rate  
287 Flowmeters  
288 Fluid acceleration  
289 Fluid flow  
290 Fluid friction  
291 Fluidized beds  
292 Fluids  
293 Fluorides  
294 Fluorinated hydrocarbons  
295 Fluorine  
296 Fluoro compounds  
297 Fluoroalkanes  
298 Forced convection  
299 Formamide, dimethyl  
300 Formulas  
301 Free convection  
302 Free molecule flow  
303 Freezing  
304 Freon  
305 Freon 11  
306 Freon 12  
307 Freon 13  
308 Freon 22  
309 Freon 113

310 Freon 114  
311 Freon 115  
312 Friction  
313 Friction coefficient  
314 Friction factors  
315 Fuel elements  
316 Fuels  
317 Fusion  
318 Gallium  
319 Gas films  
320 Gas flow  
321 Gas mixtures  
322 Gas thermometers  
323 Gas turbine disks  
324 Gas turbine materials  
325 Gas turbines  
326 Gases  
327 Chromel  
328 Heat exchangers, gas-liquid  
329 Gas-liquid mixtures  
330 Gas-vapor mixtures  
331 Generators  
332 Geometric factors  
333 Geometry  
334 Germanium-silicon alloys  
335 Glass  
336 Glycerine  
337 Glycerol  
338 Gold  
339 Graetz equation  
340 Graetz number  
341 Granular solids  
342 Graphite  
343 Graphite, ATJ  
344 Grashof number  
345 Gravity  
346 Chromium chloride  
347 Handbooks  
348 Hartmann number  
349 Hastelloy X  
350 Haynes alloy 25(L605)  
351 Hazards  
352 Heat capacity  
353 Heat exchanger materials

354 Heat exchangers  
355 Heat exchangers, air-cooled  
356 Heat exchangers, baffled  
357 Heat exchangers, counter-flow  
358 Heat exchangers, cross-flow  
359 Heat exchangers, gas-gas  
360 Heat exchangers, parallel-flow  
361 Heat exchangers, periodic-flow  
362 Heat exchangers, plastic  
363 Heat exchangers, ram-air  
364 Heat exchangers, shell  
365 Heat exchangers, tubular  
366 Heat flowmeters  
367 Heat flux  
368 Heat flux distribution  
369 Heat flux probes  
370 Heat sink capacity  
371 Heat transfer  
372 Heat transfer coefficient  
373 Heat transfer media  
374 Heat transfer models  
375 Heaters  
376 Heating  
377 Heating systems  
378 Helical flow  
379 Helium  
380 Argon - helium mixtures  
381 Argon - helium - xenon mixtures  
382 Helium - xenon mixtures  
383 Hemispheres  
384 Heptane  
385 Hexadiene  
386 Hexane  
387 High altitude  
388 Hydraulic fluids  
389 Hydraulic systems  
390 Hydrocarbon flames  
391 Hydrogen  
392 Hydrogen chloride  
393 Hydrogen sulfide  
394 Air - hydrogen mixtures  
395 Hydrogen - oxygen flames  
396 Hydrogen - oxygen mixtures



397 Hypersonic flow  
398 Hypervelocity vehicles  
399 Ice  
400 Ignition  
401 Incompressible flow  
402 Inconel  
403 Inconel X  
404 Indicators, chemical  
405 Indopol polybutene H300  
406 Inert gases  
407 Injection cooling  
408 Inorganic compounds  
409 Instrumentation  
410 Intercoolers  
411 Interferometric analysis  
412 Iodine  
413 Ionization  
414 Ionized gases  
415 Iron  
416 Isooctane  
417 Jet engines  
418 Jets  
419 Joule heating  
420 Kerosene  
421 Kinematic viscosity  
422 Knudsen number  
423 Krypton  
424 Laminar boundary layer  
425 Laminar flow  
426 Lead  
427 Leakage  
428 Length-radius ratio  
429 Chromium fluoride  
430 Heat exchangers, horizontal  
431 Helium - nitrogen mixtures  
432 Bismuth  
433 Heptane, perfluoro  
434 Hydrocarbons  
435 Liquid films  
436 Hydrogen peroxide  
437 Deuterium - hydrogen mixtures  
438 Hexane - hydrogen mixtures  
439 Indium  
440 Iridium

441 Liquid metals  
442 Heptane, perfluoro - isooctane mixtures  
443 Lead - nickel alloys  
444 Lithium hydride  
445 Nitrogen tetroxide  
446 Methane, monochlorodifluoro  
447 Methyl iodide  
448 Methylene dibromide  
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453 Pentane, 2, 2, 4 trimethyl  
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455 Glycol, polyalkylene  
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474 Magnesium oxide  
475 Magnetic equipment  
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477 Magnetic forces  
478 Magnetohydrodynamic effects  
479 Magnetohydrodynamics  
480 Manometers  
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485 Mathematical analysis

486 Mathematics  
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502 Methane, trifluoro  
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504 Methane - toluene mixtures  
505 Methanol  
506 Argon - methanol mixtures  
507 Dioxane - methanol mixtures  
508 Hexane - methanol mixtures  
509 Methyl carboxy cellulose  
510 Methyl chloride  
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512 Missiles (Viking)  
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517 Molybdenum - 0.5 Ti  
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526 Nickel  
527 Nickel alloys  
528 Nickel-plated  
529 Nickel - 20Cr  
530 Nickel - Cr(EI - 765)

531 Nickel - titanium alloys  
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534 Nitric acid - nitrogen dioxide mixtures  
535 Nitric acid - water mixtures  
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540 Nose cones  
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544 Nucleate boiling  
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546 Nusselt number  
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571 Phenyl ether  
572 Phosphorus  
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574 Phthalate, dibutyl

575 Pipes  
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578 Pipes, horizontal  
579 Pipes, inclined  
580 Pipes, porous wall  
581 Pipes, vertical  
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586 Plate-fin surfaces  
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609 Potential flow  
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611 Power plants  
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614 Prandtl number (0.1 - 1.0)  
615 Prandtl number (1.0 - 10.0)  
616 Prandtl number ( $> 10.0$ )  
617 Pressure  
618 Vinyl chloride  
619 Pressure control

620 Pressure distribution  
621 Pressure drop  
622 Pressure gages  
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647 Reactors, automatic-boiling-column  
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653 Reactors, graphite-moderated  
654 Reactors, heterogeneous  
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659 Reactors, organic-cooled  
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663 Reactors, tubular-flow  
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665 Recorders  
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673 Reliability  
674 Research  
675 Research facilities  
676 Reverse flow  
677 Review  
678 Reynolds number  
679 Reynolds number (0-20)  
680 Reynolds number (20 - 2000)  
681 Reynolds number (2000 - 200,000)  
682 Reynolds number ( > 200,000)  
683 Rhenium  
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685 Rocket motors  
686 Rod bundles  
687 Rods  
688 Rotameters  
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697 Schwarz-Christoffel transformations  
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699 Separation flow  
700 Serpentine  
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703 Shielding materials  
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707 Silicones  
708 Silver  
709 Simulation

710 Sinusoidal flow  
711 Skin friction  
712 Skin temperature  
713 Slip flow  
714 Slots  
715 Slug flow  
716 Smokes  
717 Sodium  
718 Sodium hydroxide  
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720 Lithium fluoride - potassium fluoride - sodium fluoride  
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721 Sodium fluoride - uranium fluoride - zirconium  
fluoride mixtures  
722 Solid propellants  
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725 Sound  
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727 Spacecraft materials  
728 Specific heat  
729 Specific volume  
730 Specifications  
731 Spent fuel  
732 Spheres  
733 Spikes  
734 Stability  
735 Stagnation flow  
736 Stagnation point  
737 Stagnation pressure  
738 Stagnation temperature  
739 Stainless steel  
740 Stainless steel 17-7PH  
741 Stainless steel 304  
742 Stainless steel 310  
743 Stainless steel 321  
744 Stainless steel 347  
745 Standardization  
746 Standards  
747 Stanton number  
748 Steam  
749 Steam generators  
750 Steam-water flow  
751 Stearic acid  
752 Steel



753 Steel 12Cr  
754 Steel 1018  
755 Steel 1045  
756 Steel 3140  
757 Steel EI-612  
758 Steel M1  
759 Steel M2  
760 Steel M10  
761 Steel Ti  
762 Steam - water mixtures  
763 Steel, sintered  
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765 Stroboscopic analysis  
766 Subcooling  
767 Sublimation  
768 Subliming material  
769 Submarines  
770 Subsonic flow  
771 Succinic acid  
772 Sulfur  
773 Supercooling  
774 Supercritical conditions  
775 Supercritical fluids  
776 Supercritical water  
777 Organic compounds  
778 Superheated liquids  
779 Superheated vapors  
780 Superheating  
781 Supersaturation  
782 Supersonic flow  
783 Surface boiling  
784 Surface cavities  
785 Missiles (Jupiter)  
786 Surface tension  
787 Surfaces  
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789 Sweat cooling  
790 Tables  
791 Tantalum  
792 Taylor vortices  
793 Teflon  
794 Temperature  
795 Temperature 000  
796 Temperature 010  
797 Temperature 030

798 Temperature 050  
799 Temperature 070  
800 Temperature 090  
801 Temperature 110  
802 Temperature 130  
803 Temperature 150  
804 Temperature 170  
805 Temperature 190  
806 Temperature, adiabatic wall  
807 Temperature, bulk  
808 Temperature, critical  
809 Temperature, cryogenic  
810 Temperature, mean  
811 Temperature, surface  
812 Temperature, wall  
813 Temperature control  
814 Temperature distribution  
815 Terphenyls  
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817 Test equipment  
818 Test facilities  
819 Test methods  
820 Test results  
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824 Thermal conductivity  
825 Thermal diffusion  
826 Thermal diffusivity  
827 Thermal efficiency  
828 Thermal entrance region  
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830 Thermal syphon  
831 Thermocouples  
832 Thermodynamics  
833 Thermoelectric cooling  
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835 Thermopiles  
836 Thermosyphon tubes  
837 Thickness  
838 Thorium  
839 Tin  
840 Titanium  
841 Titanium 55  
842 Titanium 75A

843 Titanium 130A  
844 Titanium 150A  
845 Titanium Tl  
846 Titanium alloys  
847 Titanium carbide  
848 Titanium tetrachloride  
849 Titanium-Mo-Cr  
850 Toluene  
851 Towers, cross - flow  
852 Toxicity  
853 Tracer studies  
854 Transient free convection  
855 Transient heat flux  
856 Transient heat transfer  
857 Transient phenomena  
858 Transient temperature  
859 Transition boiling  
860 Transition flow  
861 Transonic flow  
862 Asbestos  
863 Fiberglas  
864 Tube banks  
865 Tube orientation  
866 Tubes  
867 Tubes, baffled  
868 Tubes, capillary  
869 Tubes, circular  
870 Tubes, concentric  
871 Tubes, cylindrical  
872 Tubes, elliptical  
873 Tubes, flat  
874 Tubes, fluted  
875 Tubes, horizontal  
876 Tubes, porous  
877 Tubes, rectangular  
878 Tubes, round  
879 Tubes, smooth  
880 Tubes, vertical  
881 Tubes, vortex  
882 Tungsten  
883 Turbine blades  
884 Turbine disks  
885 Turbulence  
886 Turbulent boundary layer  
887 Turbulent flow

888 Turpentine  
889 Spectroscopic analysis  
890 Ultrasonics  
891 Uranium alloys  
892 Uranium - molybdenum alloys  
893 Bismuth - uranium dioxide slurry  
894 Uranium oxide  
895 Vacuum gages  
896 Vapor pressure  
897 Vaporization  
898 Vaporizing bodies  
899 Vapors  
900 Velocity  
901 Velocity distribution  
902 Velocity profile  
903 Vibration  
904 Viscosimeters  
905 Viscosity  
906 Viscosity coefficient  
907 Viscous fluids  
908 Visualization  
909 Vitreous silica  
910 Volume  
911 Volume boiling  
912 Vortex flow  
913 Vortices  
914 VOT (Dowtherm)  
915 Walls  
916 Waste heat utilization  
917 Water  
918 Water tunnels  
919 Water vapor  
920 Air - water mixtures  
921 Methyl ethyl ketone - water mixtures  
922 Wave motion  
923 Waxes  
924 Wedges  
925 Weight  
926 Wetting agents  
927 Wind tunnels  
928 Wings  
929 Wires  
930 Wood's metal  
931 Working fluids  
932 Xenon

933 Xylene  
934 Zero gravity conditions  
935 Zinc  
936 Zirconium oxide  
937 Zirconium  
938 Shells  
939 Shock tubes  
940 Films  
941 Solubility  
942 Sulfur dioxide  
943 Benzene - carbon tetrachloride mixtures  
944 Ozone  
945 Potassium - sodium - uranium dioxide slurry  
946 Distillation  
947 Absorption  
948 Particles  
949 Holmium  
950 Calcium  
951 Anthraquinones  
952 Convection  
953 Plates, sandwich  
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844	Titanium 150A
845	Titanium T1
846	Titanium alloys

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848	Titanium tetrachloride
849	Titanium-Mo-Cr
850	Toluene
851	Towers, cross-flow
852	Toxicity
853	Tracer studies
854	Transient free convection
855	Transient heat flux
856	Transient heat transfer
857	Transient phenomena
858	Transient temperature
859	Transition boiling
860	Transition flow
861	Transonic flow
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866	Tubes
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868	Tubes, capillary
869	Tubes, circular
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881	Tubes, vortex
882	Tungsten
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884	Turbine disks
885	Turbulence
886	Turbulent boundary layer
887	Turbulent flow
888	Turpentine

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894	Uranium oxide
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907	Viscous fluids
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909	Vitreous silica
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915	Walls
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927	Wind tunnels
928	Wings
929	Wires
930	Wood's metal
931	Working fluids

932	Xenon
933	Xylene
1030	Yttrium
934	Zero gravity conditions
935	Zinc
990	Zinc halides
937	Zirconium
936	Zirconium oxide

d. Codes for Temperature ranges

Code No.	<u>Designation</u>	<u>°K</u>	<u>°C</u>	<u>°F</u>
795	Temp 000	0 to 33	-273 to -240	-459 to -400
796	Temp 010	34 to 200	-239 to -73	-399 to -99
797	Temp 030	201 to 293	-72 to +20	-98 to +68
798	Temp 050	294 to 373	21 to 100	69 to 212
799	Temp 070	374 to 589	101 to 316	213 to 600
800	Temp 090	590 to 811	317 to 538	601 to 1000
801	Temp 110	812 to 1089	539 to 816	1001 to 1500
802	Temp 130	1090 to 1922	817 to 1649	1501 to 3000
803	Temp 150	1923 to 5811	1650 to 5538	3001 to 10,000
804	Temp 170	5812 to 55,811	5539 to 55,538	10,001 to 100,000
805	Temp 190	over 55,811	over 55,538	over 100,000



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11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY Air Force Materials Laboratory (MAAM) Research and Technology Division Air Force Systems Command Wright-Patterson AFB, Ohio 45433	
13. ABSTRACT The Convective Heat Transfer Bibliography is a compilation of 2000 references with abstracts to the monographic, periodical, and report literature issued from 1955 to 1962, on the subject of convective heat transfer and its aerospace applications. The references and abstracts have been typed on 5x8 cards. The Bibliography is supplemented by a set of 2000 IBM punched cards, constituting a subject index in considerable depth to the same references, and suitable for retrieving the information in the respective abstracts. This report defines the scope of the task, outlines the bibliographic procedures followed, and describes the end products resulting from the work.		

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